

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A method of encoding a multi-channel audio signal comprising at least two audio channels, the method comprising the steps of:

generating a single channel audio signal from the at least two audio channels, and encoding, using an encoder, the single channel audio signal into a bit stream as an encoded single channel audio signal;~~and~~

generating information from the at least two audio channels allowing to recover with a required quality level the multi-channel audio signal from the single channel audio signal and the information;~~and~~

combining the information and the single channel audio signal,

wherein the generating information step comprises the steps of:

determining a first portion of the information for a first frequency region of the multi-channel audio signal using a parameter determining circuit;

encoding, using a parameter coder, the first portion of the information into the bit stream as an encoded first portion of the information;

determining a second portion of the information for a second frequency region of the multi-channel audio signal using the

~~parameter determining circuit, the second frequency region being a portion of the first frequency region; and~~

~~encoding, using the parameter coder, the second portion of the information into the bit stream as an encoded second portion of the information,~~

~~wherein the second portion is differentially coded with respect to the first portion.~~

2. (Currently Amended) ~~A-The method of encoding a multi-channel audio signal comprising at least two audio channels as claimed in claim 1, wherein the method comprising further comprises the steps of:~~

~~generating a single channel audio signal; and~~

~~generating information from the at least two audio channels allowing to recover with a required quality level the multi channel audio signal from the single channel audio signal and the information,~~

~~wherein the generating information step comprises the steps of:~~

~~receiving a maximum allowable bit rate of the encoded multi-channel audio signal; and~~

~~only determining and encoding a first the second portion of the information for a first the second frequency region of the multi-channel audio signal if a bit rate of the encoded multi-channel audio signal comprising the single channel audio signal and~~

| the first ~~and second portions~~ ~~portion~~ of the information is not higher than the maximum allowable bit rate.

3. (Previously Presented) The method of encoding as claimed in claim 1, wherein the single channel audio signal is a particular combination of the at least two audio channels.

4. (Previously Presented) The method of encoding as claimed in claim 1, characterized in that the information comprises sets of parameters, the first portion comprises at least a first one of the sets of parameters, the second portion comprises at least a second one of the sets of parameters, wherein each set of parameters is associated with a corresponding frequency region.

5. (Previously Presented) The method of encoding as claimed in claim 4, characterized in that the sets of parameters comprise at least one localization cue.

6. (Previously Presented) The method of encoding as claimed in claim 5, characterized in that the at least one localization cue is selected from: an interaural level difference, an interaural time or phase difference, or an interaural cross-correlation.

7. (Previously Presented) The method of encoding as claimed in claim 1, characterized in that the first frequency region covers a full bandwidth of the multi-channel audio signal.

8. (Currently Amended) ~~The method of encoding as claimed in~~
~~claim 1A~~ a method of encoding a multi-channel audio signal comprising
at least two audio channels, the method comprising the steps of:
generating a single channel audio signal from the at least
two audio channels, and encoding, using an encoder, the single
channel audio signal into a bit stream as an encoded single channel
audio signal;
generating information from the at least two audio
channels allowing to recover with a required quality level the
multi-channel audio signal from the single channel audio signal and
the information; and
combining the information and the encoded single channel
audio signal.
wherein the generating information step comprises the steps of:
determining a first portion of the information for a first
frequency region of the multi-channel audio signal using a
parameter determining circuit;
encoding, using a parameter coder, the first portion of
the information into the bit stream as an encoded first portion of
the information;
determining a second portion of the information for a
second frequency region of the multi-channel audio signal using the
parameter determining circuit, the second frequency region being a
portion of the first frequency region; and

encoding, using the parameter coder, the second portion of the information into the bit stream as an encoded second portion of the information,

characterized in that the first frequency region substantially covers a full bandwidth of the multi-channel audio signal, the second frequency region covers a portion of the full bandwidth, and in that the determining of the second portion of the information is adapted to determine sets of parameters for both the second frequency region and a set of further frequency regions, the second frequency region and the set of further frequency regions substantially covering the full bandwidth, ~~where-in~~ ~~wherein~~ the set of further frequency regions comprises at least one further frequency region.

9. (Previously Presented) The method of encoding as claimed in claim 8, characterized in that the single channel audio signal and the first portion of the information form a base layer of information which is always present in the encoded multi-channel audio signal, and in that the method comprises receiving a maximum allowable bit rate of the encoded multi-channel audio signal, the second portion of the information forming an enhancement layer of information which is encoded only if the bit rate of the encoded base layer and enhancement layer is not higher than the maximum allowable bit rate.

10. (Previously Presented) The method of encoding as claimed in claim 4, characterized in that the determining of the first portion of information in a particular frame of encoded information comprises determining the first one of the sets of parameters in the particular frame, and coding the first one of the sets of parameters based on the first one of the sets of parameters of a frame preceding the particular frame.

11. (Previously Presented) The method of encoding as claimed in claim 8, characterized in that the determining of the second portion of information in a particular frame of the encoded information comprises determining the sets of parameters of the second portion in the particular frame and coding the sets of parameters of the second portion in the particular frame based on the sets of parameters of a frame preceding the particular frame.

12. (Previously Presented) The method of encoding as claimed in claim 8, characterized in that the determining of the second portion of information in a particular frame of the encoded information comprises determining the sets of parameters of the second portion in the particular frame and coding the sets of parameters of the second portion in the particular frame based on the first one of the sets of parameters of a frame preceding the particular frame.

13. (Previously Presented) The method of encoding as claimed in claim 10, characterized in that the determining comprises calculating a difference between the corresponding parameters in the particular frame and the frame preceding the particular frame.

14. (Currently Amended) An encoder for coding a multi-channel audio signal comprising at least two audio channels, the encoder comprising:

means for generating a single channel audio signal from the at least two audio channels, and for encoding the single channel audio signal into a bit stream as an encoded single channel audio signal; and

means for generating information from the at least two audio channels allowing to recover, with a required quality level, the multi-channel audio signal from the single channel audio signal and the information, and for combining the information into the bit stream of the encoded single channel audio signal,

wherein the means for generating information comprises:

means for determining a first portion of the information for a first frequency region of the multi-channel audio signal, and for encoding the first portion of the information into the bit stream as an encoded first portion of the information; and

means for determining a second portion of the information for a second frequency region of the multi-channel audio signal, the second frequency region being a portion of the first frequency

region, and for encoding the second portion of the information into the bit stream as an encoded second portion of the information, wherein the second portion is differentially coded with respect to the first portion.

15. (Currently Amended) ~~An~~ The encoder for encoding a multi-channel audio signal comprising at least two audio channels as claimed in claim 14, wherein the encoder comprising further comprises:

~~means for generating a single channel audio signal; and
means for generating information from the at least two audio channels allowing to recover with a required quality level the multi channel audio signal from the single channel audio signal and the information,
wherein the means for generating information comprises:~~

means for receiving a maximum allowable bit rate of the encoded multi-channel audio signal; and,

and wherein said means for only determining a first the second portion of the information for a first frequency region of the multi channel audio signal only determines and encodes said second portion if a bit rate of the encoded multi-channel audio signal comprising the single channel audio signal and the first and second portions portion of the information is not higher than the maximum allowable bit rate.

16. (Previously Presented) An apparatus for supplying an audio signal, the apparatus comprising:

an input for receiving an audio signal;

an encoder as claimed in claim 14 for encoding the audio signal to obtain an encoded audio signal; and

an output for supplying the encoded audio signal.

17. (Currently Amended) A computer-readable medium having stored thereon an encoded audio signal comprising:

an encoded single channel audio signal formed from at least two audio channels of a multi-channel audio signal; and

information from the at least two audio channels allowing to recover, with a required quality level, the multi-channel audio signal from the single channel audio signal and the information, wherein the information comprises:

a first portion of the information for a first frequency region of the multi-channel audio signal; and

a second portion of the information for a second frequency region of the multi-channel audio signal, the second frequency region being a portion of the first frequency region,

wherein the second portion is differentially coded with respect to the first portion.

18. (Cancelled).

19. (Currently Amended) A method of ~~decoding-recovering~~ a multi-channel audio signal ~~having been from an~~ encoded single channel audio signal, said single channel audio signal having been encoded as claimed in claim 171, the method of decoding comprising:

obtaining a decoded single channel audio signal;

obtaining decoded information from the information

allowing to recover the multi-channel audio signal from the decoded single channel audio signal and the decoded information, the decoded information comprising the first portion of the information and the second portion of the information; and

applying either the first portion of the information or the first portion and the second portion of the information on the single channel audio signal to generate the ~~decoded-recovered~~ multi-channel audio signal.

20. (Currently Amended) A decoder for decoding an encoded single channel audio signal, said encoded single channel audio signal having been encoded as claimed in claim 171, the decoder comprising:

means for obtaining a decoded single channel audio signal;

means for obtaining decoded information from the

information allowing to recover the multi-channel audio signal from the decoded single channel audio signal and the decoded information, the decoded information comprises the first portion of the information and the second portion of the information; and

means for applying the first portion of the information and the second portion of the information on the single channel audio signal to generate the decoded multi-channel audio signal.

21. (Previously Presented) An apparatus for supplying a decoded audio signal, the apparatus comprising:

an input for receiving an encoded audio signal;

a decoder as claimed in claim 20 for decoding the encoded audio signal to obtain a multi-channel output signal; and

an output for supplying or reproducing the multi-channel output signal.